

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date:

Region: Raleigh Regional Office
County: Northampton
NC Facility ID: 6600041
Inspector's Name: Will Wike
Date of Last Inspection: 08/11/2016
Compliance Code: 3 / Compliance - inspection

Facility Data Applicant (Facility's Name): West Fraser - Seaboard Lumber Mill Facility Address: West Fraser - Seaboard Lumber Mill 4400 NC Highway 186 East Seaboard, NC 27876 SIC: 2421 / Sawmills & Planing Mills General NAICS: 321113 / Sawmills Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			Permit Applicability (this application only) SIP: 02D .0512, 02D .0515, 02D .0516, 02D .0521, .02D .0530, 02D .1111, 02D .1806 NSPS: No NESHAP: MACT DDDD, MACT ZZZZ PSD: Yes PSD Avoidance: No NC Toxics: No 112(r): No Other: Title V Permit Renewal						
Contact Data			Application Data						
Facility Contact James Barham EHS Supervisor (252) 589-8265 PO Box 459 Seaboard, NC 27876	Authorized Contact Wilbur Warren General Manager (252) 589-8202 PO Box 459 Seaboard, NC 27876	Technical Contact James Barham EHS Supervisor (252) 589-8265 PO Box 459 Seaboard, NC 27876	Application Number: 6600041.15A Date Received: 12/28/2015 Application Type: Renewal Application Schedule: TV-Renewal Existing Permit Data Existing Permit Number: 03937/T25 Existing Permit Issue Date: 06/20/2017 Existing Permit Expiration Date: 05/31/2022						
Total Actual emissions in TONS/YEAR:									
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP		
2015	9.62	84.67	306.60	230.91	52.65	35.98	14.60 [Methanol (methyl alcohol)]		
2014	8.88	78.17	292.80	213.21	48.37	33.90	13.95 [Methanol (methyl alcohol)]		
2013	9.41	82.85	292.99	225.92	68.63	34.71	13.94 [Methanol (methyl alcohol)]		
2012	7.53	66.19	279.76	180.51	57.83	30.94	13.36 [Methanol (methyl alcohol)]		
2011	6.35	55.89	236.69	152.41	50.36	26.16	11.31 [Methanol (methyl alcohol)]		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> Review Engineer: Betty Gatano Review Engineer's Signature: _____ Date: _____ </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> Comments / Recommendations: Issue 03937/T26 Permit Issue Date: _____ Permit Expiration Date: _____ </td> </tr> </table>								Review Engineer: Betty Gatano Review Engineer's Signature: _____ Date: _____	Comments / Recommendations: Issue 03937/T26 Permit Issue Date: _____ Permit Expiration Date: _____
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1. Purpose of Application

West Fraser - Seaboard Lumber Mill (West Fraser) currently holds Title V Permit No. 03937T25 with an expiration date of May 31, 2022¹ for a sawmill in Seaboard, Northampton County, North Carolina. This permit application is for a TV permit renewal. The renewal application was received on December 28, 2015, or at least nine months prior to the expiration date, as required by General Permit Condition 3.K. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

West Fraser is permitted for two direct wood-fired gasification, continuous double track lumber kilns (ID No. ES-DK). These new kilns will replace the four indirect steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) and the three associated wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3). These emission sources will be permanently shut down when the new kilns are operational. A decision was made to delay issuance of the renewed permit until the new kilns are constructed and operational so that the indirect steam heated old batch lumber drying kilns and the wood-fired boilers could be removed from the permit. Delays in the construction of the new kilns, as well as a minor permit modification issued during construction period, resulted in the TV permit renewal application being placed “on hold” until June 2017.

The facility information contained in the permit application (Form A) was reviewed, and the permit and IBEAM were updated as necessary.

2. Facility Description

On August 5, 2015, Air Permit No. 0393T22 was issued to add two direct wood-fired continuous double track lumber kilns (ID No. ES-DK) to the permit. These kilns will replace the four indirect steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) and the three associated wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3), which are being removed under this permit renewal. The descriptions below do not address the emission sources being removed.

Initial Log Processing Area

Tree length logs are delivered by truck to West Fraser on paved and unpaved roads. The log crane loads logs from the storage areas onto the log deck, which manually feeds them to the debarkers. Log debarking, log sawing, lumber sawing, byproduct material collection, conveyance and storage are all included as part of the sawmill operations (ID No. F-Log Sawing). These operations were updated under Air Permit No. 03937T25 issued on June 20, 2017. Sawdust generated from the sawmill operations is supplied as fuel to the lumber drying kilns (ID No. ES-DK) through dedicated silos (ID No. I-Silos).

¹ The permit expiration date was changed to May 31, 2022 with the issuance of Air Permit No. 03937T25 because the renewed permit had not yet been issued. An associated footnote was added to the permit stating, “This permit shall expire on the earlier of May 31, 2022 or the renewal of Permit No. 03937T22 has been issued or denied.”

Lumber Drying Area

Packs of lumber from the sawmill area are heated to dry the lumber to a moisture content of 15 to 20% in the two direct wood-fired continuous double track lumber kilns (ID No. ES-DK). Each continuous kiln is direct fired with a green sawdust burner with a heat input capacity of 35 million Btu/hr. The kilns are permitted at a maximum throughput of 200 million board feet per year total.

A sawdust burner/gasification system is used to generate heat to dry the green lumber. In the wood gasification system, carbon is partially oxidized to carbon monoxide. The partial oxidation evolves heat and drives off combustible volatiles in the wood. The heated gasified stream combusts in a burner when additional oxygen is introduced into the system. The combusted gas is mixed with recirculated air to lower the temperature, and it is then blown directly into the kiln to dry the lumber.

Each kiln consists of two tracks traveling in opposite directions and three chambers designed to provide and control the environmental conditions of heat, relative humidity, and air circulation necessary for the proper drying of wood. The first chamber preheats the incoming green lumber using the heat coming off the dry lumber while providing added moisture and saturated cooling for the dried lumber. In the middle chamber, heat in the form of steam will be introduced to dry the lumber. The third chamber conditions the dried wood while preheating the incoming green lumber. Lumber is advanced automatically within each kiln base based on its moisture content in the central heating zone.

Construction of the kilns began in March of 2016 and the kilns were initially scheduled to be completed and operational in September 2016. However, construction delays have occurred throughout the project. West Fraser indicated in letters to the RRO that commissioning of the south continuous kiln began on March 3, 2017, and commissioning of the north kiln began on May 23, 2017.

Planer mill

Planer mill operations were updated under Air Permit No. 03937T25 issued on June 20, 2017 with the permitting of a new planer and trimmer/hog operation (ID No. ES-P2). The planer operations process rough, kiln dried dimensional lumber into finished lumber. These operations include planing of rough lumber and byproduct material collection, conveyance and storage. All planer operations are conducted within the planer mill building, limiting the emissions of fugitive particulate matter. A simple cyclone (ID No. CD-PC-2) functions to separate and recover the shavings and hogged material. The new planer mill will be housed adjacent to the old planer mill, which will be used to store lumber.

Additional Mill Operations

Additional mill operations include handling and loading wood byproducts. Fugitive particulate matter (PM) and PM₁₀ emissions from loading and handling wood byproducts (chips, sawdust, planer shavings and bark) are emitted throughout the site as noted above. Logs, lumber, chips, sawdust, bark and shavings are all shipped out as product.

3. History/Background/Application Chronology

Permit History since Previous Permit Renewal

October 3, 2011	TV permit renewal issued. Air Permit No. 0393T20 was issued on October 3, 2011 with a permit expiration date of September 30, 2016.
June 30, 2014	Air Permit No. 0393T21 was issued. This permit was a TV significant modification to modify the monitoring requirements for the electrostatic precipitator (ID No. ESP1) on the wood-fired boiler (ID No. ES-3) under 15A NCAC 02D .1109, Case-by-Case MACT.
August 5, 2015	Air Permit No. 0393T22 was issued. This permit was a PSD modification to construct two direct wood-fired continuous dual path kilns (ID No. ES-DK) at the Seaboard facility with production capacities of 100 million board feet per year, each. The four existing indirect steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) and three associated wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) are to be permanently shut down as part of the project.
February 5, 2016	Air Permit No. 0393T23 was issued. This permit was an administrative amendment to modify the test dates for the wood fired boilers (ID Nos. ES-NB, ES-SB, and ES-3) from 22 to 30 months from the initial stack test under the Case-by-Case MACT.
September 27, 2016	Air Permit No. 03937T24 was issued as a significant modification under 15A NCAC 02Q .0501(c)(1) to change testing requirements. The permit was modified to allow West Fraser to conduct stack testing on the boilers (ID Nos. ES-NB, ES-SB, and ES-3) every five years for pollutants with emission rates less than or equal to 80 percent of the allowable limits. Because the testing requirements were being made less stringent (i.e., the testing frequency is being decreased), this permit modification was appropriately classified as a significant modification and was sent to public notice.
June 20, 2017	Air Permit No. 03937T25 was issued as a minor modification under 15A NCAC 02Q .0515 to replace the existing sawmill and planer operations. Because the renewed permit had not yet been issued, the permit expiration date was changed to May 31, 2022 under this permit modification. An associated footnote was also added to the permit stating, "This permit shall expire on the earlier of May 31, 2022 or the renewal of Permit No. 03937T22 has been issued or denied."

Application Chronology

December 31, 2015	Received application for permit renewal.
January 4, 2016	Sent acknowledgment letter indicating the application for permit renewal was complete.

July 17, 2016	The permit renewal application was placed “on hold” because of delays in construction of the new dual path kilns (ID No. ES-DK). A decision was made to delay issuance of the renewed permit until the kilns were constructed and operational. By doing so, the four existing indirect steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) and the three associated wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) will be permanently shut down and can be removed from the permit under the Title V permit renewal.
April 25, 2017	Ms. Gatano requested the status of the construction of the new kilns. According to an e-mail from James Barham of West Fraser, the south continuous kiln commissioning started on March 3, 2017. The north kiln is still under construction, and West Fraser projects commissioning by the end of May or mid-June 2017.
May 17, 2017	DAQ staff held an internal meeting regarding the TV permit renewal application. West Fraser submitted an application for minor modification on March 3, 2017. (Note the application was not deemed complete until April 27, 2017). The DAQ decided to leave the renewal application “on hold” until the minor modification was issued.
June 20, 2017	The renewal application was removed from “on hold” with issuance of Air Permit No. 03937T25.
June 27, 2017	Betty Gatano requested James Barham submit an updated CAM statement (Form E6) for the new planer operations (ID No. ES-P2). The updated information was submitted that same day.
June 30, 2017	Draft permit and permit review forwarded internally for comments.
July 3, 2017	Received comments from Joseph Voelker, Acting Permitting Supervisor.
July 10, 2017	Will Wike of the Raleigh Regional Office (RRO) indicated he had no comments on the draft.
July 10, 2017	Draft permit and permit review, incorporating comments from internal review, was forwarded to West Fraser for comments.
July 13, 2017	Comments were received from Dale Overcash, consultant for West Fraser. The DAQ concurred with all the comments except for those regarding the required visible emission observations under 15A NCAC .02D .0521 for the new planer system (ID No. ES-P2). Prior versions of the permit allowed for semiannual visible emission observations from the planer. When the new planer was added under Air Permit 03937T25, visible emission observation frequency was changed to weekly in accordance with DAQ’s guidance for “wood material handling systems.” Mr. Overcash requested this requirement be returned to a semiannual frequency. The DAQ considered this request and concluded the visible emission observations for the planer system should be

in accordance with DAQ guidance. The frequency of visible emission observations will remain weekly.

July 14, 2017 Dale Overcash requested via e-mail that the existing planer operations (ID No. ES-P1) be returned to the permit. Mr. Overcash indicated construction on the new planer has not yet started and it may take up before the new planer operations starts up. Betty Gatano concurred but indicated the visible emission observations for the existing planer would be changed to weekly. James Barham indicated via e-mail this change was acceptable.

July 1X, 2017 Permit forwarded to public notice.

4. Permit Modifications/Changes and TVEE Discussion

The following table describes the changes to the current permit as part of the renewal process.

Previous Permit		New Permit		Description of Changes
Page No.	Section	Page No.	Section	
--	Throughout permit	--	Throughout permit	Updated all dates and permit revision numbers.
--	Insignificant Activities List	--	Insignificant Activities List	<ul style="list-style-type: none"> Removed the sawmill operations (ID No. IF-Log Sawing) and associated footnote. Potential particulate matter emissions from the sawmill operations exceed 5 tons per and thus, the emission source is not considered an insignificant activity under 15A NCAC 02Q .0503(8). The sawmill operations will be included in the permit. Removed the footnote stating the diesel-fired emergency fire pump (ID No. IS-FP) is subject to 40 CFR 63 Subpart ZZZZ. The footnote is redundant.
--	Table of Contents	--	Table of Contents	Removed section "2.3 Compliance Schedule."
--	Permit Cover Page	--	Permit Cover Page	Removed footnote regarding permit expiration date. This footnote is no longer applicable with the issuance of the renewed TV permit.

Previous Permit		New Permit		Description of Changes
Page No.	Section	Page No.	Section	
3	Section 1.0 Equipment List	3	Section 1.0 Equipment List	<ul style="list-style-type: none"> Removed the wood fired fire tube boilers (ID Nos. ES-NB, ES-SB, and ES-3) and associated footnote. These emission sources are being permanently shut down and removed from the permit. Removed steam heated lumber kilns (ID Nos. ES-3LDK, ES-2ALDK, ES-4LDK, and ES1ALDK) and associated footnote. These emission sources are being permanently shut down and removed from the permit. Returned existing planer and trimmer/hog operation (ID No. ES-P1) to the permit. The Permittee requested this change because the existing planer may be in operation for a year or more before the new planer mill (ID No. ES-P2) is operational. Added footnote for the planer and trimmer/hog operation (ID No. ES-P1) stating "Operation of existing planer and trimmer/hog operation (ID No. ES-P1) is allowed until the commencement of operation of the replacement planer and trimmer/hog operation (ID No. ES-P2)." Added sawmill operations (ID No. F-Log Sawing). Potential PM emissions from this source exceed 5 tons per year. Thus, these operations do not meet the definition of insignificant activity under 15A NCAC 02Q .0503(8).
4 – 9	2.1 A	--	--	<ul style="list-style-type: none"> Removed Section 2.1 A specifying requirements for the wood fired fire tube boilers (ID Nos. ES-NB, ES-SB, and ES-3). These emission sources are being removed from the permit under this TV renewal. Renumbered the permit accordingly.
9	2.1 B Equipment List	4	2.1 A Equipment List	<ul style="list-style-type: none"> Returned existing planer and trimmer/hog operation (ID No. ES-P1) to the permit. Added footnote for the planer and trimmer/hog operation (ID No. ES-P1) stating "Operation of existing planer and trimmer/hog operation (ID No. ES-P1) is allowed until the commencement of operation of the replacement planer and trimmer/hog operation (ID No. ES-P2)."
10	2.1 B.2.c through e	5	2.1 A.2.c through e	Updated monitoring, recordkeeping, and reporting requirements under 15A NCAC 02D .0521 with most current permitting language.

Previous Permit		New Permit		Description of Changes
Page No.	Section	Page No.	Section	
11	2.1 C	--	--	<ul style="list-style-type: none"> Removed Section 2.1 C specifying requirements for the steam heated lumber drying kilns (ID Nos. ES-2ALDK, ES-3LDK, ES-4LDK and ES1ALDK). These emission sources are being removed from the permit under this TV renewal. Renumbered the permit accordingly.
11	2.1 D Regulations Table	6	2.1 B Regulations Table	<ul style="list-style-type: none"> Referenced both equations for allowable PM under 15A NCAC 02D .0515. Specified the only requirement under 40 CFR 63, Subpart DDDD for the kilns (ID No. ES-DK) is initial notification.
11 – 13	2.1 D	6	2.1 B	<ul style="list-style-type: none"> Modified the ID number for the two direct wood-fired continuous double track lumber kilns from (ID Nos. ES-DK1 and ES-DK1) to (ID No. ES-DK) throughout this section. This numbering is consistent with the Equipment Table. Changed the term “firing of wood residuals” to “firing of wood” throughout permit condition.
11	2.1 D.1	6	2.1 B.1	Updated permit condition to add both equations for allowable PM under 15A NCAC 02D .0515.
12 – 13	2.1 D.4	7	2.1 B.4	<p>Updated the permit condition for BACT for the two direct wood -fired continuous double track lumber kilns (ID No. ES-DK) as follows:</p> <ul style="list-style-type: none"> Removed reference to the wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) and the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK). These emission sources are being removed from the permit under this TV renewal. Clarified that the production rate is total production over each consecutive 12-month period and not the rolling average production.
--	--	8	2.1 C	Added sawmill operations (ID No. F-Log Sawing). Potential PM emissions from this source exceed 5 tons per year. Thus, these operations do not meet the definition of insignificant activity under 15A NCAC 02Q .0503(8). The only applicable requirement for these operations is compliance with the fugitive dust rule under 15A NCAC 02Q .0540.
14	2.2 A – Regulations Table	9	2.2 A – Regulations Table	Removed reference to 15A NCAC 02D .1100, 15A NCAC 02Q .0711, and 15A NCAC 02Q .0317 for PSD avoidance. These regulations are no longer applicable with the removal of the wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) and the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) from the permit.

Previous Permit		New Permit		Description of Changes
Page No.	Section	Page No.	Section	
14 – 15	2.2 A.2	--	--	Removed permit condition for 15A NCAC 02D .1100. This condition is no longer applicable with the removal of the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) from the permit.
15	2.2 A.3	--	--	Removed permit condition for 15A NCAC 02Q .0711. This condition is no longer applicable with the removal of the wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) and the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) from the permit.
15 – 16	2.2 A.4	--	--	Removed permit condition for 15A NCAC 02Q .0317 for PSD avoidance. This condition is no longer applicable with the removal of the wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) and the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK) from the permit.
17	2.3 A	--	--	Removed Schedule of Compliance for the kilns (ID No. ES-DK). The initial notification requirement under 40 CFR 63 Subpart DDDD has been met.
18 – 27	3.0	10 - 19	3.0	Updated the General Conditions and the list of Acronyms with the most current version (Version 5.0 06/08/2017)

The following changes were made to the Title V Equipment Editor (TVEE) under this permit renewal:

- Removed the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK).
- Removed the wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3).
- Reactivated the existing planer and trimmer/hog operation (ID No. ES-P1) to the permit. West Fraser requested this change because the existing planer mill may be in operation for a year or more before the new planer mill (ID No. ES-P2) is operational.
- Modified the ID number for sawmill operations (ID No. F-Log Sawing). Potential PM emissions from the sawmill exceed 5 tons per year as shown in the table below, and thus, the emission source is not considered an insignificant activity under 15A NCAC 02Q .0503(8).

Pollutant	Total PM (tpy)	PM10 (tpy)	PM2.5 (tpy)
Log Sawing	14.4	0.27	0.27
Debarking	0.98	0.45	0.45
Chipper	0.45	0.45	0.45
Notes: Emissions for the sawmill operations (sawing, chipping and debarking) were provided in permit application no. 6600041.17A. Please see the permit review for Air Permit No. 03937T25 for a discussion of emission calculations for the sawmill operations (ID No. F-Log Sawing) (Judy Lee 06/20/2017).			

5. Regulatory Review

West Fraser is subject to the following regulations. The permit will be updated to reflect the most current stipulations for all applicable regulations.

- 15A NCAC 02D .0512, Particulates from Wood Products Finishing Plants – The planer and trimmer/hog operation (ID Nos. ES-P1 and ES-P2) is subject to 02D .0512. West Fraser must conduct inspection and maintenance of the control devices on these sources to ensure compliance. Requirements for the existing planer operations (ID No. ES-P1) will be returned to the permit. No changes to the monitoring, recordkeeping, or reporting requirements are needed under this renewal, and continued compliance is anticipated.
- 15A NCAC 02D .0515, Particulates from Miscellaneous Industrial Processes – The direct wood-fired continuous double track lumber kilns (ID No. ES-DK) are subject to 02D .0515. Allowable emissions of particulate matter (PM) are calculated from the following equation:

$$\begin{array}{ll} E = 4.10(P)^{0.67} & \text{For process weight rates less than or equal to 30 tons/hr} \\ E = 55.0(P)^{0.11} - 40 & \text{For process weight rates greater than 30 tons/hr} \end{array}$$

For both equations:

E = allowable emission limit for particulate matter in lb/hr; and

P = process weight rate in tons/hr.

Each kiln has a process rate of 47.6 tons per hour (based on 100 million board feet per year and assuming a density of wood of 50 lbs/ft³). The allowable emission limit is 44.12 pounds per hour per kiln for a total of 88.24 pounds of PM per hour.

As reported in the permit review for the addition of the kilns², potential PM emissions from both kilns are as follows:

$$\frac{0.30 \text{ pounds PM}}{1000 \text{ board feet}} \times \frac{10E + 06 \text{ board feet}}{\text{year}} \times \frac{1 \text{ year}}{8760 \text{ hours}} \times 2 \text{ kilns} = \frac{6.85 \text{ pounds PM}}{\text{hour}}$$

The emission factor of 0.30 pounds of PM/1,000 board feet was based on unpublished NCASI data provided by Dr. David Word.³ Using the more conventional emission factor of 0.14 pounds of PM/1,000 board feet from DAQ's "Wood Kiln Emissions Calculator Revision C" (July 2007) for a "gasifier" kiln results in a PM emission rate of 3.2 pounds of PM/hour. Either approach results in emissions that are well below the allowable emissions. Thus, compliance is indicated, and no monitoring, recordkeeping, or reporting is required.

- 15A NCAC 02D .0516, Sulfur Dioxide from Combustion Sources – The direct wood-fired continuous double track lumber kilns (ID No. ES-DK) are subject to 02D .0516. No monitoring, recordkeeping, or reporting is required when firing wood in these kilns because of the low sulfur content of the fuel. Wood is inherently low enough in sulfur that continued compliance is expected. No changes to the monitoring, recordkeeping, or reporting are required under this permit renewal.

² Gautam Patnaik (08/05/15).

³ Jenny Kelvington (05/22/2010).

- 15A NCAC 02D .0521, Control of Visible Emissions – The emission sources cited below are subject to 02D .0521. The equipment was manufactured after July 1, 1971 and must not have visible emissions of more than 20 percent opacity when averaged over a six-minute period, except as specified in 15A NCAC 02D .0521(d).
 - Direct wood-fired continuous double track lumber kilns (ID No. ES-DK) – No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of wood residual in the direct-fired lumber kilns. No changes are required under this permit renewal, and continued compliance is expected.
 - Planer and trimmer/hog operations (ID Nos. ES-P1 and ES-P2) – West Fraser must make visible observations every week to ensure compliance with 02D .0521. Requirements for the existing planer operations (ID No. ES-P1) will be returned to the permit. The permit will also be updated to reflect the most current permitting language, and continued compliance is expected.
- 15A NCAC 02D .0530, Prevention of Significant Deterioration (PSD) – The direct wood-fired continuous double track lumber kilns (ID No. ES-DK) are subject to Best Available Control Technology (BACT) limits under PSD. More discussion on PSD and BACT is provided in Section 6.
- 15A NCAC 02D .0540, Particulates from Fugitive Dust Emission Sources – According to an e-mail from James Barham of West Fraser, the sawmill operations (ID No. F-Log Sawing) at West Fraser are housed in a structure with a roof and side walls to minimize blowing rain and snow. Openings in these areas will allow logs and lumber up to 20 feet in length to pass through from machine center to machine center. The floors are elevated 12 to 15 feet from ground level with open steel grates and concrete floors. Emissions of PM from the sawmill operations are considered fugitive because the operations will not have a pneumatic system, and PM emissions from the operations cannot reasonably pass through a stack or vent to be a point source. PM emissions from the sawmill will escape from the several openings in the structure as fugitive emissions.

As a fugitive emission source, the sawmill operations are subject 02D .0540, and West Fraser must not allow fugitive dust emissions from the sawmill operations to contribute to substantive complaints or excess visible emissions beyond the property boundary. Compliance is anticipated.

- 15A NCAC 02D .1111, Maximum Achievable Control Technology (MACT) – West Fraser is subject to the following MACTs:
 - NESHAP for Plywood and Composite Wood Products, 40 CFR Part 63 Subpart DDDD.
 - NESHAP for Stationary Reciprocating Internal Combustion Engines, 40 CFR Part 63 Subpart ZZZZ.

More discussion on these MACTs is provided in Section 6.

- 15A NCAC 02D .1806, Control and Prohibition of Odorous Emissions – This condition is applicable facility-wide and is state-enforceable only. Continued compliance is anticipated.

6. NSPS, NESHAPS/MACT, NSR/PSD, RACT, 112(r), CAM

NSPS

No emission sources at West Fraser are subject to New Source Performance Standards (NSPS). This permit renewal does not affect the NSPS status of the facility.

NESHAPS/MACT

West Fraser is major source of hazardous air pollutants (HAP) and is subject to the following MACT standards.

MACT Subpart DDDD

The two direct wood-fired continuous double track kilns (ID No. ES-DK) are subject to the “NESHAP for Plywood and Composite Wood Products,” 40 CFR Part 63 Subpart DDDD. The only requirement under MACT Subpart DDDD for these emission sources is an initial notification.

The permit currently contains a schedule of compliance requiring West Fraser to submit the initial notification no later than 120 days of initial startup of the kilns (ID No. ES-DK). As allowed under 40 CFR 63.9(b)(iii), the permit application (Permit Application No. 6600041.14B) for approval of construction for the kilns (ID No. ES-DK) may be used to fulfill the initial notification requirements. West Fraser also submitted notification of the actual startup dates of both kilns as required under 40 CFR 63.9(c)(iv) via letters dated April 3, 2017 and June 9, 2017 for the south and north kilns, respectively. With submittal of these letters and the application for the permitting of the kilns, the initial notification requirement has been fulfilled and will be removed under this permit renewal.

MACT Subpart ZZZZ

The diesel-fired emergency fire pump (ID No. IS-FP) is subject to the “NESHAP for Stationary Reciprocating Internal Combustion Engines,” 40 CFR Part 63 Subpart ZZZZ. This engine is a compression ignition, existing engine, constructed before June 12, 2006. It is less than 500 HP and is located at a major source of HAPs. The following is a summary of the requirements for this engine.

- Install a non-resettable hour meter on the engine
- Change oil and filter every 500 hours of operation or annually
- Inspect all hoses and belts every 500 hours of operation or annually and replace if necessary
- Inspect air cleaner every 1,000 hours of operation or annually
- Operate no more than 100 hours for maintenance and readiness testing
- Recordkeeping and reporting requirements

This emergency fire-pump meets the definition of insignificant activities under 15A NCAC 02Q .0503(8) and is included on the insignificant activity list. Continued compliance with the MACT Subpart ZZZZ is anticipated.

PSD

West Fraser is a PSD major source for VOC, with actual emissions greater than 250 tons per consecutive 12-month period. The new kilns (ID No. ES-DK) are subject to a BACT limit of 3.76

pounds VOC (as total VOC) per thousand board feet.⁴ The production of the kilns is also limited under BACT to less than 200 million total board feet per consecutive 12-month period. These conditions were placed into the permit as part of a PSD modification to add the new kilns under Air Permit No. 03937T22 issued on August 5, 2015. No change to the BACT emission limit for VOC or the production limit of lumber is required under this permit renewal.

No testing was required to confirm the BACT limit due to the configuration of the kiln, as discussed in the Preliminary PSD permit review for Air Permit No. 03937T22. The continuous kilns have no stacks, but rather, pollutants are emitted through the open doors at both ends of the kilns. Others have also reported difficulty in testing continuous kilns. A South Carolina PDS determination reports the following:

Although testing has occurred in a limited number of units in SC, GA, and AR, the stack test does not capture total VOC emissions from these sources. There has been a wide variability in the results state to state. Lumber kilns are not well suited for stack testing. The design of a lumber drying kiln makes it extremely difficult and costly to perform stack testing. Batch lumber drying kilns have multiple vents that open and close at different times throughout the batch cycle. The flow and composition of vent gases leaving each vent changes over the course of the drying cycle, and batch time can be 24 hours or more in duration. The variability with time is much lower with a continuous kiln; however, capturing the exhaust stream is even more challenging. The exhaust gases from continuous kilns leave the kiln through gaps between the lumber being dried and the openings on either end of the kiln through which the lumber passes. In some cases, it is possible to build a hood-type structure on either end of the kiln to direct a portion of the exhaust gas to a stack or stacks. The stack can be designed to meet EPA Method 1 sampling criteria and accommodate sampling ports. However, capturing 100% of the kiln exhaust through such a hood structure is virtually impossible due to the size of the opening required for the lumber to enter/exit the kiln and the need to avoid generating a vacuum inside the kiln itself. The large lumber pass-through openings also prohibit accurate measurement of the total exhaust flow leaving the kiln. Flow measurements can be collected from the hood/stack, but no accurate measurements are possible of the exhaust not captured by the hood.⁵

For these reasons, testing for the VOC BACT limit was not required for Air Permit No. 03937T22 and will not be required as part of this TV permit renewal.

The BACT permit condition currently allows West Fraser to operate wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) and the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALDK, ES-4LDK and ES1ALDK) up to 30 days after the start-up of the new kilns (ID No. ES-DK). These requirements will be removed under this permit renewal because the renewed TV permit is anticipated to be issued after this 30-day period has ended. The BACT permit condition also refers to 12-month rolling average of production. This language is incorrect and should reference the total production over the 12-month period and not the rolling average production. The permit will be

⁴ Please refer to the Preliminary PSD permit review for Air Permit No. 03937T22 for a discussion of the development of the BACT limit of 3.76 (Gautam Patnaik, 08/05/2015).

⁵ SC Department of Health and Environmental Control (December 23, 2015) Preliminary PSD Determination for New South Lumber Company – Darlington, Darlington, Darlington County, SC.

updated to make this correction, as shown in revised permitting language provided below. Continued compliance is anticipated.

4. 15A NCAC 02D .0530: PREVENTION OF SIGNIFICANT DETERIORATION

- a. The Permittee shall comply with all the requirements in accordance with the PSD, Final Determination by the Division of Air Quality dated March 13, 2015. Pursuant to 15A NCAC 02D .0530 "Prevention of Significant Deterioration" [40 CFR 51.166(j) Best Available Control Technology Review (BACT)] and the PSD, Final Determination, the Permittee shall comply with the following BACT limits for the two direct wood-fired continuous double track lumber kilns (**ID No. ES-DK**):
 - i. The Permittee shall not emit to atmosphere more than 3.76 pounds of volatile organic compound (VOC) (as total VOC) per thousand board feet of lumber (3.76 lbs of VOC /1000 bf) from the two direct wood-fired continuous double track lumber kilns (**ID No. ES-DK**).
 - ii. The Permittee shall not exceed 200 million total board feet per consecutive 12-month period from the two direct wood-fired continuous double track lumber kilns (**ID No. ES-DK**). The Permittee shall be deemed in noncompliance with 15A NCAC 02D .0530 if the production rate exceeds 200 million total board feet per consecutive 12-month period.

Testing [15A NCAC 02Q .0508(f)]

- b. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limits given in Section 2.1 B.4.a.i above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .0530.

Monitoring/Recordkeeping [15A NCAC 02Q .0508(f)]

- c. To ensure compliance with the limits in Section 2.1 B.4.a.i and ii above, the Permittee shall calculate and record the monthly production rate and the 12-month production rate from these kilns (**ID No. ES-DK**). The Permittee shall be deemed in noncompliance with 15A NCAC 02D .0530 if the monthly production rate and/or the 12-month production rate are not calculated or if the records are not maintained.

Reporting [15A NCAC 02Q .0508(f)]

- d. The Permittee shall submit a summary report of the monitoring and recordkeeping activities in Section 2.1 A.4.c postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. The report shall contain the following:
 - i. The monthly production for the kilns (**ID No. ES-DK**) for the previous 17 calendar months;
 - ii. The 12-month production rate for the kilns (**ID No. ES-DK**). The production rate must be calculated for each of the 12-month periods over the previous 17 months; and
 - iii. All instances of deviations from the requirements of this permit must be clearly identified.

Additionally, West Fraser accepted a PSD avoidance condition of 436.12 tons of VOC per consecutive 12-month period when kiln (ID No. ES1ALDK) was added under Air Permit No. 03937T15 issued on October 9, 2004. The PSD avoidance condition applies to the wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3) and the steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALKD, ES-4LDK and ES1ALDK). This avoidance condition will be removed with the removal of these emission sources under this TV permit renewal. Despite removal of these emission sources, West Fraser remains a PSD major source due to potential VOC emissions from the new kilns (ID No. ES-DK).

112(r)

The facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in 112(r). This permit renewal does not affect the 112(r) status of the facility.

CAM

40 CFR Part 64, Compliance Assurance Monitoring, is applicable to any pollutant-specific emission unit (PSEU), if the following three conditions are met:

- the unit is subject to any (non-exempt: e.g. pre-November 15, 1990, Section 111 or Section 112 standard) emission limitation or standard for the applicable regulated pollutant.
- the unit uses any control device to achieve compliance with any such emission limitation or standard.
- unit's precontrol potential emission rate exceeds either 100 tons/yr (for criteria pollutants) or 10/25 tons/yr (for HAPs).

With the removal of the three wood-fired fire tube boilers (ID Nos. ES-NB, ES-SB, and ES-3) from the facility, West Fraser has only the planer operations that use control devices. The existing planer operation (ID No. ES-P1) is not subject to CAM as discussed in the previous permit renewal,⁶ while the new planer operation (ID No. ES-P2) must be evaluated for CAM under this renewal. Particulate matter emissions from the planer operation (ID No. ES-P2) are controlled via the simple cyclone (ID Nos. CD-PC-2). Typically, planer operations are not considered subject to CAM because emissions of wood dust regulated as PM10 from planing operations are estimated to be zero per current guidance (DAQ's "Woodworking Emissions Calculator Revision C" July 2007). However, in the permit application to add the new planer (Application No. 6600041.17A), the facility provided emission estimates of PM, PM10, and PM2.5 from the planer operations.⁷ The table below shows the emissions associated with the new planer operations.

Pollutant	Uncontrolled Emission (tpy)	Controlled Emissions (tpy)
Total PM	36.2	17.0
PM10	30.7	14.45
PM2.5	18.1	8.50

Notes:

- PM emissions from the planer were based on a production throughput 200,000,000 board feet per year, which is the production limit under BACT. Section 2.1 D.4 of the air permit contains the federally enforceable BACT limit.
- No control efficiency was provided for the new cyclone in Application No. 6600041.17A. As part of the permit review for Air Permit No. 03937T25 (Judy Lee 06/20/2017), a control efficiency was estimated for this device using cyclone parameters and assumptions regarding particle size distribution. The estimated overall control efficiency was 47%. This value was applied to the controlled emissions to arrive at a precontrolled emission rate. The control efficiency is a conservative assumption for small particulate matter emissions because the control efficiency for smaller particles (i.e., PM and PM10) is expected to be less than the overall control efficiency.

As shown in the table above, the precontrolled emissions from the cyclone were estimated as less than 100 tons per year of PM10. Thus, CAM does not apply to this control device.

⁶ Jenny Sheppard (October 3, 2011).

⁷ Please see the permit review for Air Permit No. 03937T25 for a complete discussion of emission calculations for the new planer mill operations (Judy Lee 06/20/2017).

7. Facility Wide Air Toxics

West Fraser has previously modeled emissions of formaldehyde and phenol from the steam heated kilns (ID Nos. ES-3LDK, ES-2ALDK, ES-4LDK and ES1ALDK) to demonstrate compliance with 02D .1100. The modeled limits, which are included in the current permit, are provide the table below for these kilns.

Emission Source	Toxic Air Pollutants	Emission Limits
Kiln No. ES-4LDK	formaldehyde phenol	0.276 pounds per hour 0.196 pounds per hour
Kiln No. ES-2ALDK	formaldehyde phenol	0.276 pounds per hour 0.196 pounds per hour
Kiln No. ES-3LDK	formaldehyde phenol	0.161 pounds per hour 0.114 pounds per hour
Kiln No. ES1ALDK	formaldehyde phenol	0.276 pounds per hour 0.196 pounds per hour

The facility has also previously demonstrated that facility-wide emissions of beryllium, cadmium, mercury, acetaldehyde, and methyl ethyl ketone are less than their Toxic Emission Permitting Rates (TPERS), as shown in the following table.

Emission Source	Toxic Air Pollutant	Emission Limit
facility wide emission sources when firing contaminated sawdust in the wood-fired boilers	beryllium cadmium mercury	0.28 pounds per year 0.37 pounds per year 0.013 pounds per day
facility wide emission sources including the lumber drying kilns	acetaldehyde methyl ethyl ketone	6.8 pounds per hour 22.4 pounds per hour; 78 pounds per day

The modeled limits and the TPER table above apply to the indirect steam heated batch lumber drying kilns (ID Nos. ES-3LDK, ES-2ALDK, ES-4LDK and ES1ALDK) and the three wood-fired boilers (ID Nos. ES-NB, ES-SB and ES-3). With these emission sources being removed under this permit renewal, the associated permit conditions for 02D .1100 and 02Q .0711 will be removed as well.

When direct wood-fired gasifier, continuous kilns (ID No. ES-DK) were permitted under Air Permit No. 0393T22, West Fraser conducted an air toxics analysis showing these kilns did not pose an unacceptable risk to human health. Please refer to the permit review in support of Air Permit No. 0393T22 for a more detailed discussion of the analysis.⁸ This permit renewal does not affect the status of NC Air Toxics for these kilns, and continued compliance is anticipated.

8. Facility Emissions Review

Potential emissions in the table below were provided in Permit Application No. 6600041.14B to add the two wood-fired continuous double track lumber kilns (ID No. ES-DK) to the permit and in Permit Application No. 6600041.17A to replace the existing sawmill and planer operations. The potential emissions do not include emissions of the boilers or steamed heated kilns, which are being removed

⁸ Gautam Patnaik (08/05/2015).

from the permit under this renewal. Actual emissions for criteria pollutants and HAPs are provided in the header of this permit review.

Pollutants	Potential Emissions (tons/year)				
	Kilns (ID ES-DK)	Fire Pump (IS-FP)	Planer (ID No. ES-P2)	Fugitive Emissions from Sawmill Operations (ID No. IF-Log Sawing)	Total
PM	30	0.12	17.0	15.92	63.04
PM10	18	0.12	14.45	1.28	33.85
PM2.5	15	0.12	8.50	1.26	24.88
NO _x	28	1.63	--	--	29.6
CO	73	0.35	--	--	73.4
SO ₂	7.67	0.108	--	--	7.8
VOC	376	0.132	--	--	376.1
CO _{2e}	65,345	--	--	--	65,345
Notes: <ul style="list-style-type: none"> • With the exception for emissions of PM/PM10/PM2.5, all emissions above were provided in Appendix B to Permit Application No. 6600041.14B. • PM/PM10/PM2.5 emissions from the planer operations and sawmill operations were obtained from the revised emission estimate from Permit Application No. 6600041.17A, assuming a throughput limit from the planer mill of 200,000,000 board feet of lumber per year. 					

9. Compliance Status

The most recent inspection was conducted on August 11, 2016 by Will Wike of the RRO. The facility appeared to operate in compliance with all applicable air quality regulations and permit conditions at the time of inspection. Additionally, a signed Title V Compliance Certification (Form E5) indicating the facility was in compliance with all applicable requirements was included with the permit renewal.

10. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period for the public, with an opportunity for a public hearing. Consistent with 15 A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 02Q .0521 above. Virginia is an effected state within 50 miles of the facility.

11. Other Regulatory Considerations

- A P.E. seal is NOT required for this application.
- A zoning consistency determination is NOT required for this application.

12. Recommendations

The permit renewal application for West Fraser – Seaboard Lumber Mill in Seaboard, Northampton County, NC has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 03937T26.